

Attorney Docket No.: 944-3.154-1  
Serial No.: 10/666,920

In the claims: Please amend the claims as indicated.

1. (Currently amended) A method for use by a feedback-signal-transmitting entity in indicating to a feedback-signal-receiving entity during a current time interval one or another state (signaling active state, discontinuous transmitting (DTX) state) in a plurality of different possible states (signaling active state, DTX state) in any one of which the feedback-signal-transmitting entity can exist in any time interval in which the feedback-signal-transmitting entity either signals all or part of a payload message to the feedback-signal-receiving entity or instead operates in discontinuous mode, wherein the payload message is sent in response to a packet previously transmitted by the feedback-signal-receiving entity and conveys feedback indicating whether the packet was successfully received, and is transmitted in a predefined offset of one or more time intervals from the current time interval, and comprises a sequence of payload message symbols selected from a set of possible payload message symbols, the method characterized in that it comprises comprising:

~~a step in which in order to indicate whether the payload message is being or was transmitted in a predefined positive or negative offset of one or more time intervals from the current time interval, the feedback-signal-transmitting entity additionally signals signalling in the current time interval an indication symbol selected from a set of possible indication symbols, and providing preamble or postamble signalling, in order to indicate whether the payload message is being or was transmitted in a predefined positive or negative offset of one or more time intervals from the current time interval;~~

~~and further characterized in that wherein the indication symbol differs from each of the possible payload message symbols, and in that the indication symbol is sent either in advance of or after the payload message.~~

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2. (Previously presented) A method as in claim 1, wherein the indication symbol is selected based on when the time interval in which the payload is sent or was sent occurs compared to the current time interval.
3. (Currently amended) A method as in claim 1, wherein the payload message provided by the feedback-signal-transmitting entity is provided on a feedback channel as feedback to the feedback-signal-receiving entity for data transmitted over a data-transmission channel by the feedback-signal-receiving entity, wherein in response to receiving and successfully decoding a data signal provided by the feedback-signal-receiving entity, the feedback-signal-transmitting entity provides to the feedback-signal-receiving entity a corresponding acknowledgement message (ACK/NACK) in one of the sequences of time intervals corresponding to the time of receipt of the data signal in a predetermined way; and
- ~~— further characterized in that in the step of wherein in providing the indication symbol, the feedback-signal-transmitting entity provides as the indication symbol a preamble symbol in the current time interval if an acknowledgement message (ACK/NACK) is to be sent in the next time interval but not in the current time interval.~~
4. (Currently amended) A method as in claim 3, further characterized in that ~~wherein~~ a signaling cycle related to the previous, current or next time interval in the feedback channel is adapted according to a minimum applicable interval either in the data-transmission channel or in the feedback channel, whichever minimum applicable interval is higher.
5. (Currently amended) The method of claim 3, further characterized in that ~~wherein~~ if neither an acknowledgement message

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nor a preamble symbol is to be sent in the current time interval, and an acknowledgement message was sent in the previous time interval, then a step is performed in which the feedback-signal-transmitting entity provides as the indication symbol at least one postamble symbol in one or more respective consecutive time intervals prior to the feedback-signal-transmitting entity entering a mode in which it does not transmit on the feedback channel.

6. (Currently amended) A method as in claim 5, further characterized in that: wherein a signaling cycle related to the previous, current or next time interval in the feedback channel is adapted according to a minimum applicable interval either in the data-transmission channel or in the feedback channel, whichever minimum applicable interval is higher.

7. (Currently amended) The method of claim 5, further characterized in that: in the step in which the feedback signal-transmitting entity provides wherein in providing at least one postamble symbol, the feedback-signal-transmitting entity provides two consecutive postamble symbols as the indication symbol and a second indication symbol, if neither a preamble symbol nor an acknowledgement message (ACK/NACK) is to be sent in either the current time interval or the next time interval, and acknowledgement messages (ACK/NACK) were sent in the two immediately preceding time intervals.

8. (Currently amended) A feedback-signal-transmitting entity, characterized in that it is operative according to the method of claim 1.

9. (Currently amended) A feedback-signal-transmitting entity, characterized in that it is operative according to the method of claim 2.

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10. (Currently amended) A feedback-signal-transmitting entity, characterized in that it is operative according to the method of claim 3.

11. (Previously presented) A feedback signal transmitting entity, characterized in that it is operative according to the method of claim 4.

12. (Previously presented) A feedback signal transmitting entity, characterized in that it is operative according to the method of claim 5.

13. (Previously presented) A feedback signal transmitting entity, characterized in that it is operative according to the method of claim 6.

14. (Previously presented) A feedback signal transmitting entity, characterized in that it is operative according to the method of claim 7.

Claims 11-14 are canceled.

15. (Currently amended) A telecommunication system, including a feedback-signal-transmitting entity and a feedback-signal-receiving entity, characterized in that wherein the feedback-signal-transmitting entity is operative according to the method of claim 1, and the feedback-signal-receiving entity uses is configured to use the preamble and postamble signalling to determine the current state of the signal-transmitting entity from among the plurality of different possible states (signalling active states, DTX state).

16. (Currently amended) A telecommunication system, including a feedback-signal-transmitting entity and a feedback-signal-receiving entity, characterized in that wherein the feedback-signal-

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transmitting entity is operative according to the method of claim 2, and the feedback-signal-receiving entity ~~uses-is configured to use~~ the preamble and postamble signalling to determine the current state of the feedback-signal-transmitting entity from among the plurality of different possible states (signalling active states, DTX state).

17. (Previously presented) A telecommunication system, including a feedback signal transmitting entity and a feedback signal receiving entity, characterized in that the feedback signal transmitting entity is operative according to the method of claim 3, and the feedback signal receiving entity uses the preamble and postamble signalling to determine the current state of the feedback signal transmitting entity from among the plurality of different possible states (signalling active states, DTX state).

18. (Previously presented) A telecommunication system, including a feedback signal transmitting entity and a feedback signal receiving entity, characterized in that the feedback signal transmitting entity is operative according to the method of claim 5, and the feedback signal receiving entity uses the preamble and postamble signalling to determine the current state of the feedback signal transmitting entity from among the plurality of different possible states (signalling active states, DTX state).

19. (Previously presented) A telecommunication system, including a feedback signal transmitting entity and a feedback signal receiving entity, characterized in that the feedback signal transmitting entity is operative according to the method of claim 6, and the feedback signal receiving entity uses the preamble and postamble signalling to determine the current state of the feedback signal transmitting entity from among the plurality of different possible states (signalling active states, DTX state).

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20. (Previously presented) A telecommunication system, including a feedback signal transmitting entity and a feedback signal receiving entity, characterized in that the feedback signal transmitting entity is operative according to the method of claim 7, and the feedback signal receiving entity uses the preamble and postamble signalling to determine the current state of the feedback signal transmitting entity from among the plurality of different possible states (signalling active states, DTX state).

Claims 17-20 are canceled.

21. (Previously presented) A method as in claim 1, wherein the payload message symbols include an ACK and a NACK symbol, and the possible indication symbols include either at least a preamble symbol or a postamble symbol, and further wherein the payload message symbols and the possible indication symbols are each different sequences of a same predetermined size.

22. (Previously presented) A method as in claim 21, wherein the payload message symbols and the possible indication symbols each include a bi-orthogonal code set.

23. (Previously presented) A method as in claim 22, wherein the payload message symbols and the possible indication symbols each include some bits making up the bi-orthogonal code set and additional bits, and the additional bits of each symbol besides the ACK symbol are opposite in polarity to the corresponding bits in the ACK symbol.

24. (Previously presented) A method as in claim 22, wherein the possible indication symbols include both a preamble symbol and a postamble symbol, and the payload message symbols and the preamble and postamble symbols are as follows:

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ACK:	+1	<u>+1</u>	<u>+1</u>	+1	<u>+1</u>	<u>+1</u>	+1	<u>+1</u>	<u>+1</u>	+1
NACK:	-1	<u>-1</u>	<u>-1</u>	-1	<u>-1</u>	<u>-1</u>	-1	<u>-1</u>	<u>-1</u>	-1
Preamble:	-1	<u>-1</u>	<u>+1</u>	-1	<u>-1</u>	<u>+1</u>	-1	<u>-1</u>	<u>+1</u>	-1
Postamble:	-1	<u>+1</u>	<u>-1</u>	-1	<u>+1</u>	<u>-1</u>	-1	<u>+1</u>	<u>-1</u>	-1

whereby the ACK, NACK, preamble and postamble symbols therefore each include three-times repeated pairs of bit sets each making up a bi-orthogonal code set and the remaining four bits of each symbol besides the ACK symbol are opposite in polarity to the corresponding bits in the ACK symbol.

25. (Currently amended) A method, comprising:

~~a step in which a feedback-signal-transmitting entity receives receiving a packet transmission from a feedback-signal-receiving entity; and~~

~~a step in which, in response to the packet transmission, the feedback-signal-transmitting entity signals signalling in a current time interval, in response to the packet transmission, an indication symbol selected from a set of possible indication symbols, and providing preamble or postamble signalling in order to indicate whether a payload message providing feedback to the packet transmission is being or was transmitted in a predefined positive or negative offset of one or more time intervals from the current time interval;~~

wherein the payload message includes one or another of various possible payload message symbols and the indication symbol differs from each of the possible payload message symbols, and is sent either in advance of or after the payload message.

26. (Currently amended) A method as in claim 25, wherein the payload message provided by the feedback-signal-transmitting entity is provided on a feedback channel as feedback to the feedback-

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signal-receiving entity for data transmitted over a data-transmission channel by the feedback-signal-receiving entity, wherein in response to receiving and successfully decoding a data signal received at a time of receipt and provided by the feedback-signal-receiving entity, the feedback-signal-transmitting entity provides to the feedback-signal-receiving entity a corresponding acknowledgement message (ACK/NACK) in one of the sequences of time intervals corresponding to the time of receipt of the data signal in a predetermined way:

~~wherein in the step in which in providing the indication symbol is provided, the feedback-signal-transmitting entity provides as the indication symbol a preamble symbol in the current time interval if an acknowledgement message (ACK/NACK) is to be sent in the next time interval but not in the current time interval.~~

27. (Previously presented) A method as in claim 25, wherein the payload message symbols include an ACK and a NACK symbol, and the possible indication symbols include either at least a preamble symbol or a postamble symbol, and further wherein the payload message symbols and the possible indication symbols are each sequences of ten bits.

28. (Currently amended) A feedback-signal-transmitting apparatus, comprising:

means for receiving a packet transmission from a packet-transmitting apparatus; and

~~means by which, in response responsive to the packet transmission, the feedback signal transmitting apparatus signals for signalling in a current time interval an indication symbol selected from a set of possible indication symbols, and providing preamble or postamble signalling in order to indicate whether a payload message providing feedback to the packet transmission is~~

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being or was transmitted in a predefined positive or negative offset of one or more time intervals from the current time interval;

wherein the payload message is configured to include ~~includes~~ one or another of various possible payload message symbols and the indication symbol differs from each of the possible payload message symbols ~~all differing from the indication symbol, and wherein the apparatus is configured to~~ is sent ~~send~~ the indication symbol either in advance of or after the payload message.

29. (Currently amended) A feedback-signal-transmitting apparatus as in claim 28, wherein the apparatus is configured to receive the payload message ~~is provided by~~ from the feedback-signal-transmitting apparatus on a feedback channel as feedback to the packet-transmitting apparatus for data transmitted over a data-transmission channel by the packet-transmitting apparatus, wherein the apparatus is further configured so that in response to receiving and successfully decoding a data signal provided by the packet-transmitting apparatus and received at a time of receipt occurring in a time interval in a sequence of time intervals, the feedback-signal-transmitting apparatus provides to the packet-transmitting apparatus a corresponding acknowledgement message (ACK/NACK) in one of the sequences of time intervals corresponding to the time of receipt of the data signal in a predetermined way, and

wherein the means by which the indication symbol is provided ~~provides~~ apparatus is further configured so as to provide as the indication symbol a preamble symbol in the current time interval if an acknowledgement message (ACK/NACK) is to be sent in the next time interval but not in the current time interval.

30. (Previously presented) A feedback-signal-transmitting apparatus as in claim 28, wherein the payload message symbols

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include an ACK and a NACK symbol, and the possible indication symbols include either at least a preamble symbol or a postamble symbol, and further wherein the payload message symbols and the possible indication symbols are each sequences of ten bits.

31. (Currently amended) A user equipment—~~(UE)~~ device including a feedback-signal-transmitting apparatus as in claim 28.

32. (Previously presented) A radio access network element including a feedback-signal-transmitting apparatus as in claim 28.

33. (Previously presented) A Node B of a radio access network including a feedback-signal-transmitting apparatus as in claim 28.

34. (Previously presented) A telecommunication system, including a packet-transmitting apparatus for providing a packet transmission and a feedback-signal-transmitting apparatus as in claim 28 for providing a payload message and the indication symbol in response to the packet transmission.

35-40. Canceled.

41. (New) A feedback-signal-transmitting apparatus, comprising:  
a receiver for receiving a packet transmission from a packet-transmitting apparatus; and

a physical layer, responsive to the packet transmission, for signaling in a current time interval an indication symbol selected from a set of possible indication symbols, wherein the indication symbol provides preamble or postamble signalling in order to indicate whether a payload message providing feedback to the packet transmission is being or was transmitted in a predefined positive or negative offset of one or more time intervals from the current time interval;

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wherein the payload message is configured to include one or another of various possible payload message symbols all differing from the indication symbol, and wherein the apparatus is configured to send the indication symbol either in advance of or after the payload message.

42. (New) A feedback-signal-transmitting apparatus, comprising:

a receiver, for receiving a packet from a feedback-signal-receiving entity; and

a physical layer, responsive to the packet, for signaling all or part of a payload message to the feedback-signal-receiving entity, wherein the payload message conveys feedback indicating whether the packet was successfully received and is transmitted in a predefined offset of one or more time intervals from a current time interval and comprises a sequence of payload message symbols selected from a set of possible payload message symbols; and

wherein, in order to indicate whether the payload message is being or was transmitted in a predefined positive or negative offset of one or more time intervals from the current time interval, the physical layer is configured to signal in the current time interval an indication symbol selected from a set of possible indication symbols providing preamble or postamble signaling, wherein the indication symbol differs from each of the plurality of possible payload message symbols.

43. (New) An apparatus as in claim 42, wherein the apparatus is configured to select the indication symbol based on when the time interval in which the payload is sent or was sent occurs compared to the current time interval.

44. (New) An apparatus as in claim 42, wherein the apparatus is configured to send the payload message on a feedback channel as feedback to the feedback-signal-receiving entity for data

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transmitted over a data-transmission channel by the feedback-signal-receiving entity, wherein the feedback-signal-transmitting entity is configured so that upon receiving and successfully decoding a data signal provided by the feedback-signal-receiving entity the feedback-signal-transmitting entity provides to the feedback-signal-receiving entity a corresponding acknowledgement message in one of the sequences of time intervals corresponding to the time of receipt of the data signal in a predetermined way, and wherein the apparatus is configured to provide as the indication symbol a preamble symbol in the current time interval if an acknowledgement message is to be sent in the next time interval but not in the current time interval.

45. (New) An apparatus as in claim 42, wherein the payload message symbols include an ACK and a NACK symbol, and the possible indication symbols include either at least a preamble symbol or a postamble symbol, and further wherein the payload message symbols and the possible indication symbols are each different sequences of a same predetermined size.

46. (New) An apparatus as in claim 42, wherein the payload message symbols and the possible indication symbols each include a bi-orthogonal code set.

47. (New) An apparatus as in claim 46, wherein the payload message symbols and the possible indication symbols each include some bits making up the bi-orthogonal code set and additional bits, and the additional bits of each symbol besides the ACK symbol are opposite in polarity to the corresponding bits in the ACK symbol.

48. (New) An apparatus as in claim 42, wherein the possible indication symbols include both a preamble symbol and a postamble symbol, and the payload message symbols and the preamble and postamble symbols are as follows:

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ACK:	+1	<u>+1</u>	<u>+1</u>	+1	<u>+1</u>	<u>+1</u>	+1	<u>+1</u>	<u>+1</u>	+1
NACK:	-1	<u>-1</u>	<u>-1</u>	-1	<u>-1</u>	<u>-1</u>	-1	<u>-1</u>	<u>-1</u>	-1
Preamble:	-1	<u>-1</u>	<u>+1</u>	-1	<u>-1</u>	<u>+1</u>	-1	<u>-1</u>	<u>+1</u>	-1
Postamble:	-1	<u>+1</u>	<u>-1</u>	-1	<u>+1</u>	<u>-1</u>	-1	<u>+1</u>	<u>-1</u>	-1

whereby the ACK, NACK, preamble and postamble symbols therefore each include three-times repeated pairs of bit sets each making up a bi-orthogonal code set and the remaining four bits of each symbol besides the ACK symbol are opposite in polarity to the corresponding bits in the ACK symbol.